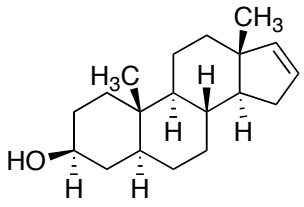


a Steroid

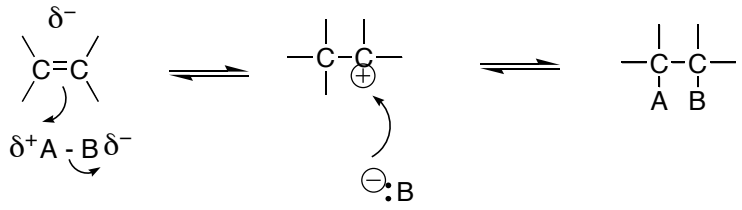
A male pheromone

Hydrocarbons → C and H only
Physical properties

- alkanes – very non-polar
- alkenes – non-polar, but more polar than alkanes
- alkynes – non-polar, but more polar than alkenes

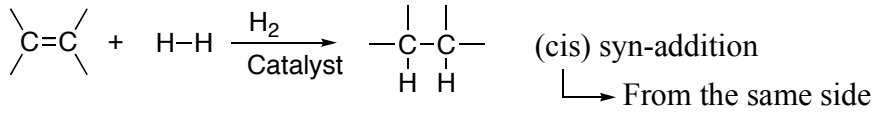
- overall, they all are very non-polar
- density less than water (1.0 g/cm^3) ρ = rho = density $\sim$ 0.8g/cm^3
- immiscible with water
- dissolve well in non-polar solvents (eg, haloalkanes)
- low mp, bp compared to other organic molecules due to hydrophobic interaction
- temporary dipole and London (dispersion) forces control self association
- reactivity: alkynes > alkenes > alkanes
- double (and triple) bonds have partial negative charge in the centre of the bond and partial positive charges on the carbon nuclei

Reaction of Alkenes: Addition Reactions



Reverse is called an elimination reaction

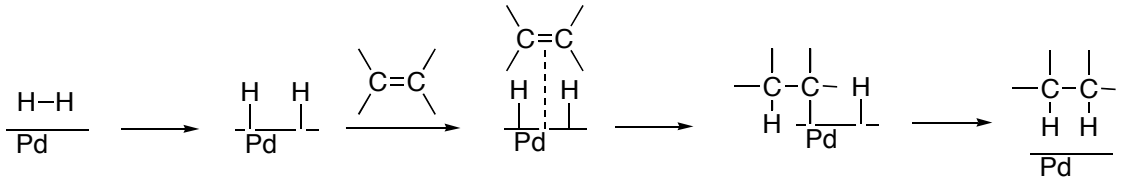
Hydrogenation (H-H addition) : Addition of H_2

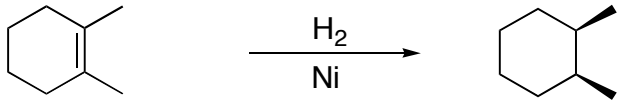


Catalyst is one of Ni (Nickel), Pd(Palladium), Pt(Platinum)

Stereospecific Reaction: Is one in which the stereochemistry of the starting material determines the stereochemistry of product.

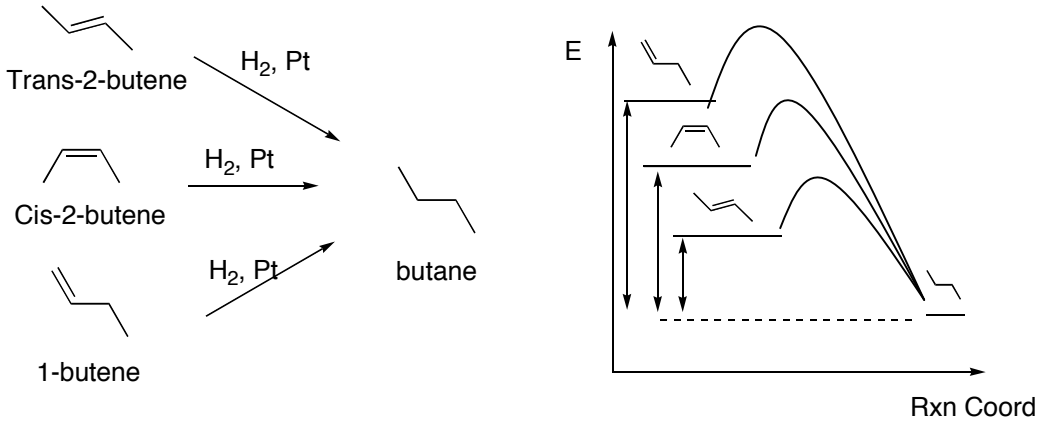
Catalyst: Lowers the activation energy of a reaction (transition state) but is not permanently transformed.



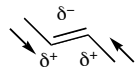


1,2-dimethylcyclohexene *cis*-1,2-dimethylcyclohexane

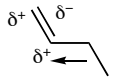
- hydrogenation gives syn (cis) addition, giving the cis-product as above



All of the above reactions are exothermic.



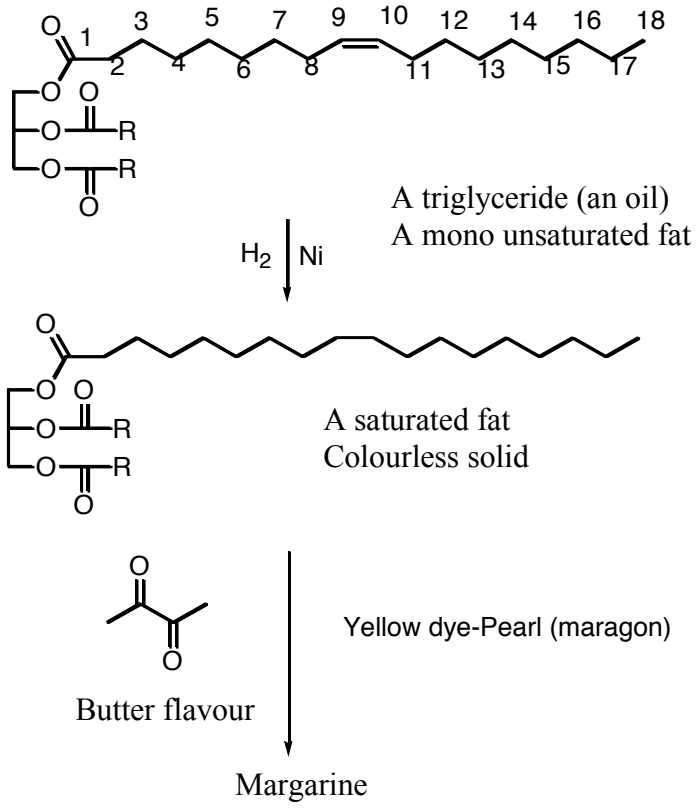
more alkyl substitution gives increased electron donation, making the alkene more stable and less reactive



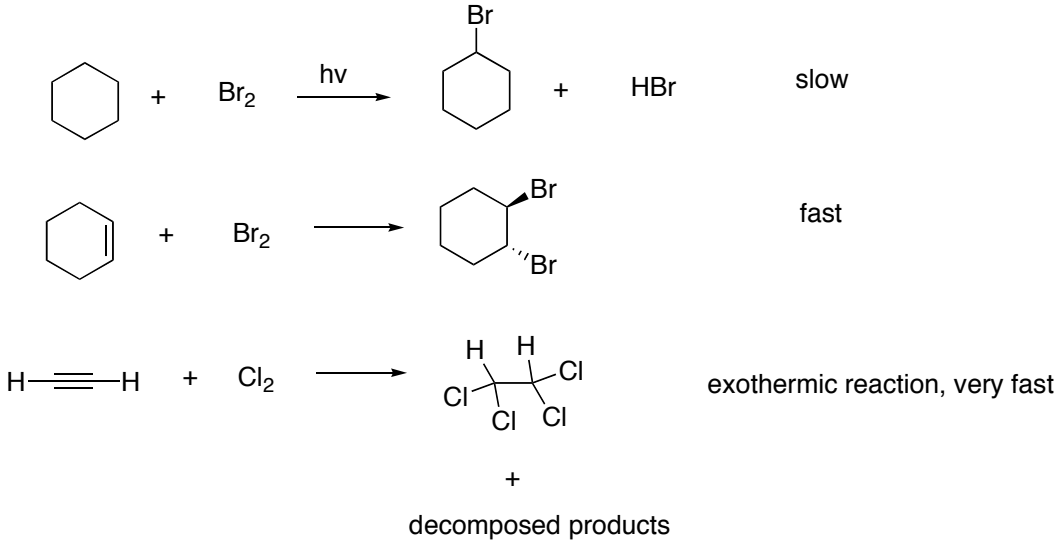
trans more stable than cis due to sterics

FAT Hydrogenation

Eg.

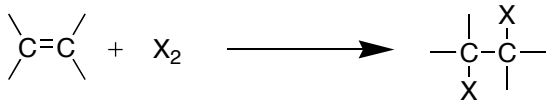


Demonstration:



Addition of X_2 to alkenes (Halogenation)

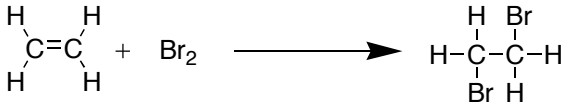
General reaction:



X= Cl or Br

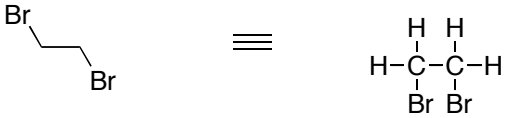
Anti or trans addition

Example:

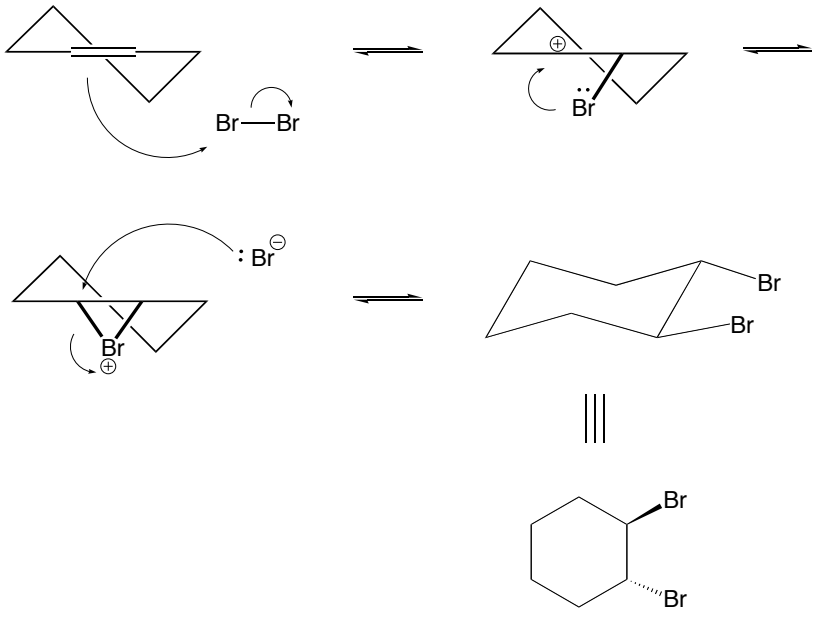


Anti or trans addition

free rotaion about
C-C bond



Mechanism:



trans-1,2-dibromocyclohexane